

HALOPHYTES GO CIRCULAR -SALT-TOLERANT PLANTS FOR FOOD, FEED, BIO-COMPOUNDS AND BIOENERGY

AQUACOMBINE FINAL CONFERENCE

- 21 NOV 2023 / 10H00 18H00
- AALBORG UNIVERSITY, NIELS BOHRS VEJ 8, 6700 ESBJERG, DENMARK.

How to deal with one of the important challenges of the 21st century to meet the world's demand for sustainably produced biomass for both food and the growing bio-products sector? Salt-tolerant plant species such as Salicornia or Crithmum can be the answer. The AQUACOMBINE project aimed to create a new circular industry with co-production of food, feed and bio products from this sustainable type of plants. The circular approach of AQUACOMBINE combines aquaculture, farming and bioprocessing to utilize all fractions of the produced biomass and produce value added food, feed, bio-compounds and bioenergy.

AQUACOMBINE

PANEL SESSION I: CULTIVATION OF HALOPHYTES

Initiative e.V

VISIT THE DEMONSTRATOR AT AALBORG UNIVERSITY







PANEL SESSION II: BIOREFINERY CONCEPT

PANEL SESSION III: AOUACULTURAL **TRIALS**

PANEL SESSION IV: AQUACOMBINE FUTURE POTENTIAL

VISIT THE ALPHA AQUA DEMONSTRATOR



After registering, you will receive a confirmation email containing details about joining the meeting.

Find out about detailed results in the poster session or meet the speakers for a discussion. AQUACOMBINE final conference will give you the whole AQUACOMBINE experience.







this consortium's view and the European Commission is not responsible for any use that may be made of the information it contains











universidade de aveiro theoria poiesis praxis



PANEL SESSION I: CULTIVATION OF HALOPHYTES

How to cultivate halopyhtes indoor and outdoor -Pros and cons, challenges and differentiation of options

Plants can be cultivated in ways: in a nutrient solution, in several substrates and in soil. Each cultivation technique has pros and cons, also dependent on the climatic conditions, the plant species and the purpose of the crop plants. Halophyte cultivation provides additional challenges. After a short introduction we will highlight project results and discuss several aspects from different perspectives with the divers panel.

MODERATION AND IMPULS



PROF. DR. JUTTA PAPENBROCK LEIBNIZ UNIVERSITY HANNOVER

PANEL



RUI MIRANDA ROCHA RIASEARCH, LDA



FLÁVIA DUARTE EUROPEAN SALINE FARMER'S









PROF. DR. JUTTA PAPENBROCK LEIBNIZ UNIVERSITY HANNOVER

Professor at the Institute of Botany of the LUH, Germany. Leader of WP2 "Cultivation of Halophytes"

Topics: Interested in stress-tolerant plant species and their development to new crop plants, in the effects of biostimulants on plant growth and in the characterization of specialized molecules from plants. Expertise in: Plant physiology, molecular biology, analytics.

Jutta.Papenbrock@botanik.uni-hannover.de Phone: +49 511 762 3788

https://www.botanik.uni-hannover.de/en/research/research-groups/sulfur-metabolismand-abiotic-stress







RUI MIRANDA ROCHA RIASEARCH, LDA

Rui is a Marine Biologist with specialization in Aquaculture (University of Algarve, Portugal) and holds a PhD in Biology and Applied Biosciences from the University of Aveiro (Portugal).

CEO at RIASEARCH. He coordinates the contract-research trials and R&D projects and manages exploitation of their results. He's a specialist in sustainable aquaculture practices, with a focus on nutrition, stress, growth, and fish welfare, as well as expertise in RAS technology.

Rui has also been involved in several projects aiming at the sustainable development of aquaculture in developing countries.

ruirocha@riasearch.pt

LinkedIn: rui-miranda-rocha-a75247152 Phone +351 939 412 836

<u>www.riasearch.pt</u>







FLÁVIA DUARTE EUROPEAN SALINE FARMER'S

Graduated in 2011 in management and postgraduated in economy, at ISCTE Business school, Flávia Duarte has been involved in project management in the fields of internationalization and regional development in the areas of efficiency and energetic sustainability. Recently she has been participating in the development of innovative products in what regards technology transfer. She has also participated both in European and national projects being responsible by its full accomplishment in what concerns the tasks proposed.

Flávia worked on the economic, environmental, and social assessment of the project with regard to social impact and development in rural areas. Besides this she supported the process of business plan development as well as the road map process for exploitation. She has also developed and established farmer associations.

flavia.duarte@irradiare.com

LinkedIn: flávia-duarte-6ba82448 Phone: 00351 935 252 450





PANEL SESSION II: BIOREFINERY CONCEPT

The Halophyte Biorefinery: How to extract, fractionate, purify and ferment the halophyte biomass to co-produce ingredients for food/feed/cosmetics and bioenergy

In this session Prof. Mette Hedegaard Thomsen, who is also the coordinator of the Aquacombine project, will give a short introduction to the approach and achievements in the biorefining of the three halophyte biomasses caried out during the four years of the Aquacombine project. In a dialog with the expert biorefinery partners the different conversion technologies developed in the project will be presented and challenges and opportunities in the halophyte biorefining will be discussed.

MODERATION AND IMPULS



PROF. METTE HEDEGAARD THOMSEN AALBORG UNIVERSITY

PANEL



PROF. PAUL CHRISTAKOPOULOS LULEÅ UNIVERSITY



MALTHE FREDSGAARD AALBORG UNIVERSITY



PROF. HINRICH UELLENDAHL FLENSBURG UNIVERSITY OF APPLIED SCIENCES



PROF. IWONA CYBULSKA UNIVERSITE CATHOLIQUE DE LOUVAIN



DR. JOB TCHOUMTCHOUA CELABOR



DR. LAURA HULKKO AALBORG UNIVERSITY







PROF. METTE HEDEGAARD THOMSEN AALBORG UNIVERSITY

Mette Hedegaard Thomsen a recognized scientist with-in the field of biomass processing and biorefining. She is the head of the Bioenergy and Bioproducts research group at Aalborg University, Energy Department. She is the coordinator of the

Aquacombine project as well as participant in other European and national projects. She is also the co-founder of two spin-off companies; Haloderma: a cosmetic company making polyphenolic rich bioactive cometics and Halorefine: an extraction based biorefinery making green ingredients and chemicals.

<u>mht@energy.aau.dk</u>

LinkedIn: Mette Hedegaard Thomsen Phone: +4593562196

https://vbn.aau.dk/da/persons/137899







PROF. PAUL CHRISTAKOPOULOS LULEÅ UNIVERSITY

Paul Christakopoulos leads the Biochemical Process Engineering group at Luleå University of Technology. He has dedicated over three decades to advancing technologies that promote sustainable carbon cycles, focusing on retaining carbon within the loop. With more than 350 scientific publications in this field, he also serves as a Work Package leader in the Aquacombine project. Additionally, he plays an active role in four other current European projects and coordinates numerous national projects.

paul.christakopoulos@ltu.se

LinkedIn: Paul Christakopoulos Phone: +46725767379

https://www.ltu.se/staff/p/pauchr-1.99948?l=en







PROF. HINRICH UELLENDAHL FLENSBURG UNIVERSITY OF APPLIED SCIENCES

Hinrich Uellendahl is Professor for (bio)chemical process engineering at FUAS. He has been working on biomass conversion into fuels and chemicals for more than 20 years with focus on biogas production from organic wastes and agricultural residuals as stand-alone technology or in combination with biorefinery concepts.

In the AQUACOMBINE project, Hinrich Uellendahl is WP leader of WP9 - Develop and scale up of processes for conversion of residual fractions from extraction processes into biogas (from carbohydrates) and biochar (from lignin).

hinrich.uellendahl@hs-flensburg.de

LinkedIn: Hinrich Uellendahl Phone: +49 (0)461 805 1293

https://hs-flensburg.de/hochschule/personen/uellendahl







PROF. IWONA CYBULSKA UNIVERSITE CATHOLIQUE DE LOUVAIN

Iwona Cybulska is a scientist with many years of experience in the topics of biorefineries, biomass fractionation to generate intermediates, their characterization and downstream processing to target bio-based commodity and high-value chemicals as well as processing of halophytes and medicinal plants: botanical extracts isolation, purification and characterization for application in the production of food, nutraceuticals and cosmetics.

In the Aquacombine project, she is the leader of WP5 with the main focus on protein and xylooligosaccharides recovery and purification.

lwona.Cybulska@uclouvain.be LinkedIn: Iwona Cybulska







DR. LAURA HULKKO AALBORG UNIVERSITY

Laura Hulkko carried out and completed her PhD thesis work within AQUACOMBINE project under supervision of Prof. Mette Hedegaard Thomsen, focusing on green biorefinery processing of halophyte biomass towards functional feed supplements, nutraceuticals, and cosmetics. Her work includes botanical extract characterisation and analysing their biological activities.

lssh@energy.aau.dk LinkedIn: Laura Hulkko

https://vbn.aau.dk/da/persons/148747







DR. JOB TCHOUMTCHOUA CELABOR

Job Tchoumtchoua is a Natural Product Chemist with expertise on the characterization of secondary metabolites from natural sources. He currently held a position as R&D Project Leader and Responsible of EU Programmes at the Biomass Valorisation Platform of Celabor (Belgium). He has been involved in the implementation of several EU-founded Projects at Celabor.

His researches in Aquacombine project are focused on green extraction of polyphenols from halophytes, purification methodologies and analytical development.

jtc@celabor.be

LinkedIn : Job Tchoumtchoua Phone: +32 479 99 44 34

<u>www.celabor.be</u>







MALTHE FREDSGAARD AALBORG UNIVERSITY

Malthe Fredsgaard has completed his PhD under supervision of Professor Mette Hedegaard Thomsen with the focus on the optimizing the extraction and purification of polyphenols, and scaling the process from laboratory scale to demonstration scale using only green and sustainable methods and solvents.

Using established methods, Fredsgaard has, in collaboration with Professor Thomsen, designed the AQUACOMBINE extraction demonstration plant, which is a cornerstone of the AQUACOMBINE project, and is capable of a daily production 200-300 L *Salicornia* extract.

mfre@energy.aau.dk LinkedIn: Malthe Fredsgaard Phone: +4542667941

https://vbn.aau.dk/da/persons/148748





PANEL SESSION III: AQUACULTURAL TRAILS

The power of halophytes boosting aquatic animal health for a more sustainable industry.

Aquaculture is the fastest-growing sector in animal production. However, to ensure sustainability, the industry must explore new ingredients and functional additives that enhance animal welfare, disease prevention, and production efficiency. In our presentation, we will introduce our project's key findings and engage in a comprehensive discussion of these aspects with our diverse panel of experts.

MODERATION AND IMPULS



<mark>RUI MIRANDA ROCHA</mark> RIASEARCH, LDA

PANEL



JIWAN CHETTRI ALPHA AQUA A/S



LOURENÇO PINTO A2S - CIIMAR



<u>MÁRIO PACHECO</u> UNIVERSITY OF AVEIRO



FARMER, FLATLANTIC S.A.









RUI MIRANDA ROCHA RIASEARCH, LDA

Rui is a Marine Biologist with specialization in Aquaculture (University of Algarve, Portugal) and holds a PhD in Biology and Applied Biosciences from the University of Aveiro (Portugal).

CEO at RIASEARCH. He coordinates the contract-research trials and R&D projects and manages exploitation of their results. He's a specialist in sustainable aquaculture practices, with a focus on nutrition, stress, growth, and fish welfare, as well as expertise in RAS technology.

Rui has also been involved in several projects aiming at the sustainable development of aquaculture in developing countries.

ruirocha@riasearch.pt

LinkedIn: rui-miranda-rocha-a75247152 Phone +351 939 412 836

<u>www.riasearch.pt</u>







JIWAN CHETTRI ALPHA AQUA A/S

Jiwan is a fish biologist with specialization in fish health and aquaculture and holds a Ph.D. degree from the University of Copenhagen, Denmark.

R&D project manager: Jiwan is responsible for coordinating and executing various research projects both within and outside of Alpha Aqua. These projects involve the use of effluent from RAS, improving fish welfare in the RAS environment, conducting feeding and nitrification-denitrification trials, testing Alpha Aqua's own equipment, and overseeing various activities at Alpha Aqua's test and commercial farm.

He has extensive experience in the research and development and has been involved in many EU and Danish government-funded research projects related to aquaculture and fish welfare.

jkc@dk.alpha-aqua.com

LinkedIn: https://www.linkedin.com/in/jiwan-chettri/. Mobile: +4552686198

https://www.alpha-aqua.com/







LOURENÇO PINTO AQUATIC ANIMAL HEALTH (A2S) - CIIMAR

Lourenço is a Biologist (University of Aveiro, Portugal) with Master in Marine Biology (University of Porto, Portugal) and holds a PhD in Animal Science – Nutrition from ICBAS – University of Porto (Portugal).

Currently is an auxiliar researcher in A2S (GRINNAQUA project) team developing research dedicated to the development of functional feeds as strategies that could contribute to the enhancement of fish and shrimp health and welfare.

His research has been conducted at the CIIMAR. His present research interests are the optimization of a sustainable and economic efficient aquaculture through fish nutrition and the modulation of their immune system and fish welfare.

Lourenço has also been involved in several projects and contract research.

lourenco.pinto@ciimar.up.pt

LinkedIn: lourenço-ramos-pinto-5986b741

https://www2.ciimar.up.pt/team.php?id=215







RENATA SERRADEIRO FARMER, FLATLANTIC S.A.

Renata is a Biologist, graduated in Aquatic Sciences (ICBAS, University of Porto, Portugal).

In 2016 Renata created Riasearch. As an expert in aquaculture industry, she brings knowhow

to projects in the areas of fish larval rearing, grow-out, RAS technology, and interaction between nutrition, stress, growth, and fish welfare.

Renata has more than 20 years of expertise in the aquaculture industry, holding various management positions, such as R&D, production, and general manager.

renataserradeiro@riasearch.pt

LinkedIn: renata-serradeiro-88a1913a Phone: +351 935 432 503

<u>www.riasearch.pt</u>







MÁRIO PACHECO UNIVERSITY OF AVEIRO

Mário is a Biologist with specialization in Physiotoxicology. He holds PhD and Aggregation/Habilitation degrees from the University of Aveiro (UA), Portugal. Presently, he is Full Professor at UA and researcher at the Associate Laboratory CESAM - Centre for Environmental and Marine Studies.

His current research interests are focused on the toxicity mechanisms in aquatic organisms and the identification of novel functional feeds/foods.

In AQUACOMBINE project, he is involved in the identification of Salicornia potential as functional ingredient for aquafeeds, focusing on the protective abilities towards DNA integrity and antioxidant system strengthening.

mpacheco@ua.pt Phone: (+351) 234 370789

https://www.cesam-la.pt/mpacheco/





PANEL SESSION IV: AQUACOMBINE FUTURE POTENTIAL

Utilization of AQUACOMBINE results from a product and process perspective.

Prof Dr Axel Gottschalk, Bremerhaven University of Applied Sciences, who worked with his team on the technical and economic analysis and the business plan, will provide insights into the results. The other panelists representing a product or service that benefits from the results of the AQUACOMBINE project. They will share their experiences and give answers to the questions of what is the most important result for their company, how they benefit from it and what they expect for the future.

MODERATION



SABINE HÖFEL FOOD-PROCESSING INITIATIVE E.V.

PANEL



PROF. DR.-ING. AXEL GOTTSCHALK UNIVERSITY OF APPLIED SCIENCE BREMERHAVEN



CHRISTOFFER MØLLER KRISTENSEN CEO, ALPHA AQUA A/S



HENRIK TRIBLER CEO, HALOREFINE



EVELYNE KABEMBA KANIK CEO, HALODERMA









SABINE HÖFEL FOOD-PROCESSING INITIATIVE E.V.

Sabine Höfel is a Life Science Technologist, she is involved in national and international projects focusing on food transition, circular economy, resource efficiency and digitalization. She is also a partner in a network with national and international partners from the entire food value chain. "Connecting competences for innovative solutions and thus strengthening the competitiveness of small and medium sized food companies" summarizes best hers and her companies' mission.

In AQUACOMBINE she and her colleagues were part of the exploitation and dissemination team. Within this process Food-Processing was responsible for the road map process for exploitation. The team also worked on the economic, environmental, and social assessment of the project, specifically social impact, impact of new food SMEs, and rural development.

sabine.hoefel@foodprocessing.de LinkedIn: sabine-höfel-2a8a93174

www.foodprocessing.de







EVELYNE KABEMBA KANIKI CEO, HALODERMA

Before co-founding Haloderma, Evelyne was a research assistant at AAU in charge of the proof of concept project to commercialise sustainable dermocosmetics extract from halophytes. Haloderma is a spin-off business from the AquaCombine project, funded in 2021. The company develops dermatological solutions for problematic skin with bioactive extracts from halophytes.

<u>ekk@Haloderma.dk</u>

LinkedIn /in/evelyne-kabemba-kaniki/

<u>www.haloderma.dk</u>

